

SEQUENCE LISTING

<110> Kukolj, George and Pause, Armin
<120> SELF REPLICATING RNA MOLECULE FROM
HEPATITIS C VIRUS
<130> 13/083-3-D2
<140> To be assigned
<141> 2002-12-04
<150> 60/257,857
<151> 2000-12-22
<160> 25
<170> FastSEQ for Windows Version 4.0
<210> 1
<211> 8639
<212> DNA
<213> HCV

<220>
<221> CDS
<222> (1803)...(8408)

<400> 1
ggccagcccc cgattgggg cgacactcca ccatagatca ctccctgtg aggaactact 60
gtttcacgc agaaagcgta tagccatggc gtttagtatga gtgtcgtgca gcctccagga 120
ccccccctcc cgggagagcc atagttgtct gcggAACGGG tgtagtacacc ggaattgcca 180
ggacgaccgg gtcccttctt ggtcaaccc gctcaatgcc tggagatttg ggcgtgcccc 240
cgcgagactg ctagccgagt agtgttgggt cgccaaaggc cttgtggta tcgcctgatag 300
ggtgcttgcg agtgccccgg gaggtctcg agaccgtgca ccatgagcac gaatcctaaa 360
cctcaaagaa aaaccaaagg gcgcgcctatg attgaacaag atggattgca cgcaggttct 420
ccggccgcctt ggggtggagag gctattcgcc tatgactggg cacaacagac aatcggctgc 480
tctgatgccg ccgtgttccg gctgtcagcg caggggcgccc cggttcttt tgtcaagacc 540
gacctgtccg gtccctgaa tgaactgcg gacgaggcag cgccgtatc gtggctggcc 600
acgacggcgcg ttccctgcgc agctgtgctc gacgttgtca ctgaagcggg aagggactgg 660
ctgctattgg gcgaagtgcc ggggcaggat ctcctgtcat ctcacccctgc tcctgcccag 720
aaagtatcca tcatggctga tgcaatgcgg cggctgcata cgcttgatcc ggctacctgc 780
ccattcgacc accaagcgaa acatcgcatc gagcgcgcac gtactcgat ggaagccggt 840
cttgcgatc agatgatct ggacgaagag catcaggggc tcgcgcgc cgaactttc 900
gccaggctca aggcgcgcatt gcccgcgc gaggatctcg tcgtgaccca tggcgatgcc 960
tgcttgcga atatcatggt gaaaaatggc cgctttctg gattcatcgat ctgtggccgg 1020
ctgggtgtgg cggaccgcata tcaggacata gctgtggcta cccgtatc tgctgaagag 1080
cttggcgccg aatgggtgtc cgccttcctc gtgccttacg gtatgcgc tcccgcattcg 1140
cagcgcatcg ccttctatcg cttctgtac gagttcttct gatgtcgcc ccagatgtta 1200
acagaccaca acggttccc tctagcggga tcaattccgc cccccccct aacgttactg 1260
gccgaagccg ctggaaataa ggcgggtgtg cggttgcata tatgttattt tccaccat 1320
tgcgtctt tggcaatgtg agggcccgaa aacctggccc tgccttctg acgagcatc 1380
ctaggggtct ttccctc gccaaaggaa tgcaggatct gttgaatgtc gtgaaggaaag 1440
cagttccctc ggaagctctc tgaagacaaa caacgtctgt agcgcaccct tgcaggcagc 1500

ggaacccccc acctggcgac aggtgcctct gcccggccaaa gccacgtgta taagatacac	1560
ctgcaaaggc ggcacaaccc cagtgccacg ttgtgagttt gatagttgtg gaaagagtca	1620
aatggctctc ctcagaacgtca ttcaacaagg ggctgaagga tgcccagaag gtacccatt	1680
gtatggatc tgatctgggg cctcggtgca catgctttac atgtgtttac tcgaggtaa	1740
aaaacgtcta ggccccccga accacgggga cgtggtttc cttgaaaaa cacgataata	1800
cc atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta	1847
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val	
1 5 10 15	
ggt ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct	1895
Gly Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala	
20 25 30	
agg ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac	1943
Arg Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His	
35 40 45	
ttg caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc	1991
Leu Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala	
50 55 60	
gtc atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc	2039
Val Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile	
65 70 75	
acc aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct	2087
Thr Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala	
80 85 90 95	
ggt ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt	2135
Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg	
100 105 110	
gca tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg	2183
Ala Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met	
115 120 125	
gct ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat	2231
Ala Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His	
130 135 140	
ctc acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg	2279
Leu Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala	
145 150 155	
gtg gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc	2327
Val Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile	
160 165 170 175	
acc tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg	2375
Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu	
180 185 190	
ccc gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac	2423
Pro Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp	

195	200	205	
agc ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac Ser Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr 210	215	220	2471
tcc caa cag acg cga ggc cta ctt ggc tgc atc atc act acg ctc aca Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr 225	230	235	2519
ggc cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc Gly Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr 240	245	250	2567
gca aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr 260	265	270	2615
gtc tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca Val Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro 275	280	285	2663
atc acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln 290	295	300	2711
gcg ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg Ala Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser 305	310	315	2759
gac ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg 320	325	330	2807
cgg ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr 340	345	350	2855
ttg aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala 355	360	365	2903
gtg ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala 370	375	380	2951
gtg gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg Val Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro 385	390	395	2999
gtc ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag Val Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln 400	405	410	3047
gtg gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg			3095

Val Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val			
420	425	430	
ccg gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg		3143	
Pro Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro			
435	440	445	
tcc gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat		3191	
Ser Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His			
450	455	460	
ggt atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt		3239	
Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly			
465	470	475	
gcc ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt		3287	
Ala Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly			
480	485	490	495
tgc tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca		3335	
Cys Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser			
500	505	510	
act gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg		3383	
Thr Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala			
515	520	525	
gag acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg		3431	
Glu Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro			
530	535	540	
gga tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc		3479	
Gly Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser			
545	550	555	
agc act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc		3527	
Ser Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr			
560	565	570	575
atc aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt		3575	
Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Cys			
580	585	590	
gat gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca		3623	
Asp Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala			
595	600	605	
tat tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc		3671	
Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val			
610	615	620	
att gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc		3719	
Ile Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe			
625	630	635	

gac tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe 640 645 650 655	3767
agc ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp 660 665 670	3815
gcg gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg Ala Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met 675 680 685	3863
ggc att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc Gly Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe 690 695 700	3911
gat tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac Asp Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr 705 710 715	3959
gag ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac Glu Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn 720 725 730 735	4007
aca cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc Thr Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser 740 745 750	4055
gtc ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act Val Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr 755 760 765	4103
aag cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg Lys Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr 770 775 780	4151
gtg tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg Val Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp 785 790 795	4199
aag tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg Lys Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu 800 805 810 815	4247
ctg tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc Leu Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro 820 825 830	4295
ata acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc Ile Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val 835 840 845	4343
acg agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg Thr Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala 850 855 860	4391

tat tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg Tyr Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu 865 870 875	4439
tcc gga aag ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag Ser Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu 880 885 890 895	4487
ttc gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag Phe Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln 900 905 910	4535
gga atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg Gly Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu 915 920 925	4583
caa aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc Gln Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser 930 935 940	4631
aag tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc Lys Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe 945 950 955	4679
atc agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac Ile Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn 960 965 970 975	4727
ccc gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg Pro Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro 980 985 990	4775
ctc acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg Leu Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val 995 1000 1005	4823
gcc gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc Ala Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala 1010 1015 1020	4871
ggc atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt Gly Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu 1025 1030 1035	4919
gtg gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg Val Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val 1040 1045 1050 1055	4967
gcc ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt Ala Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val 1060 1065 1070	5015
aac cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc Asn Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val	5063

1075	1080	1085	
gtg tgc gca gcg ata ctg cgt cggt cac gtc ggc cca ggg gag ggg gct Val Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala 1090	1095	1100	5111
gtg cag tgg atg aac cggt ctg ata gcg ttc gct tcg cggt aac cac Val Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His 1105	1110	1115	5159
gtc tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc Val Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val 1120	1125	1130	5207
act cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt Thr Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu 1140	1145	1150	5255
cac cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg His Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp 1155	1160	1165	5303
cta aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag Leu Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys 1170	1175	1180	5351
acc tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc Thr Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe 1185	1190	1195	5399
ttc tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc Phe Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile 1200	1205	1210	5447
atg caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa Met Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys 1220	1225	1230	5495
aac ggt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg Asn Gly Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp 1235	1240	1245	5543
cat gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc His Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro 1250	1255	1260	5591
tcc ccg gcg cca aat tat tct agg gcg ctg tgg ccg gtg gct gct gag Ser Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu 1265	1270	1275	5639
gag tac gtg gag gtt acg cggt gtg ggg gat ttc cac tac gtg acg ggc Glu Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly 1280	1285	1290	5687
atg acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa			5735

Met	Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	
				1300				1305						1310		
ttc	ttc	aca	gaa	gtg	gat	ggg	gtg	cg	ttg	cac	agg	tac	gct	cca	g	5783
Phe	Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	
				1315				1320						1325		
tgc	aaa	ccc	ctc	cta	cg	gag	gag	gtc	aca	ttc	ctg	gtc	ggg	ctc	aat	5831
Cys	Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	
				1330				1335						1340		
caa	tac	ctg	gtt	ggg	tca	cag	ctc	cca	tgc	gag	ccc	gaa	ccg	gac	gta	5879
Gln	Tyr	Leu	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	
				1345				1350						1355		
gca	gtg	ctc	act	tcc	atg	ctc	acc	gac	ccc	tcc	cac	att	acg	g	5927	
Ala	Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	
				1360				1365						1370		1375
acg	gct	aag	cgt	agg	ctg	gcc	agg	gga	tct	ccc	ccc	tcc	ttg	gcc	agc	5975
Thr	Ala	Lys	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Leu	Ala	Ser	
				1380				1385						1390		
tca	tca	gct	agc	cag	ctg	tct	g	cct	tcc	ttg	aag	gca	aca	tgc	act	6023
Ser	Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	
				1395				1400						1405		
acc	cgt	cat	gac	tcc	ccg	gac	g	c	tc	atc	gag	gcc	aa	ctc	ctg	6071
Thr	Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	
				1410				1415						1420		
tgg	cg	cag	gag	atg	ggc	ggg	a	ac	atc	acc	cgc	gtg	gag	tca	gaa	5119
Trp	Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	
				1425				1430						1435		
aag	gta	gta	att	ttg	gac	tct	t	cc	ctc	caa	g	cg	g	g	gat	6167
Lys	Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	
				1440				1445						1450		1455
gag	agg	gaa	gta	tcc	gtt	ccg	g	cg	g	atc	ctg	cg	gg	tcc	agg	6215
Glu	Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg	Ser	Arg	Lys	
				1460				1465						1470		
ttc	cct	cga	gcg	atg	ccc	ata	tgg	gca	cgc	ccg	gat	tac	aa	cct	cca	6263
Phe	Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	
				1475				1480						1485		
ctg	tta	gag	tcc	tgg	aag	gac	ccg	gac	tac	gtc	cct	cca	gt	gta	cac	6311
Leu	Leu	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	
				1490				1495						1500		
ggg	tgt	cca	ttg	ccg	cct	gcc	aag	gcc	cct	ccg	ata	cca	cct	cca	cg	6359
Gly	Cys	Pro	Leu	Pro	Pro	Ala	Lys	Ala	Pro	Pro	Ile	Pro	Pro	Pro	Arg	
				1505				1510						1515		

agg aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg Arg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu 1520 1525 1530 1535	6407
gct gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc Ala Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val 1540 1545 1550	6455
gac agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc Asp Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly 1555 1560 1565	6503
gac gct gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag Asp Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu 1570 1575 1580	6551
ggg gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta Gly Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val 1585 1590 1595	6599
agc gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca Ser Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr 1600 1605 1610 1615	6647
tgg aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg Trp Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu 1620 1625 1630	6695
ccc atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val 1635 1640 1645	6743
tat gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc Tyr Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr 1650 1655 1660	6791
ttt gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag Phe Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys 1665 1670 1675	6839
gag atg aag gct aag gct tcc aca gtt aag gct aaa ctt cta tcc gtg Glu Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val 1680 1685 1690 1695	6887
gag gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt Glu Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe 1700 1705 1710	6935
ggc tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac Gly Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn 1715 1720 1725	6983
cac atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca His Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro 1730 1735 1740	7031

att gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro 1745 1750 1755	7079
gag aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu 1760 1765 1770 1775	7127
ggg gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc Gly Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr 1780 1785 1790	7175
ctc cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct Leu Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro 1795 1800 1805	7223
gga cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc Gly Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys 1810 1815 1820	7271
cct atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act Pro Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr 1825 1830 1835	7319
gag aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg Glu Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu 1840 1845 1850 1855	7367
gcc ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr 1860 1865 1870	7415
atc ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg 1875 1880 1885	7463
cg ^g tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu 1890 1895 1900	7511
aca tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag Thr Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln 1905 1910 1915	7559
gac tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu 1920 1925 1930 1935	7607
agc gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag Ser Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu 1940 1945 1950	7655
gct atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu	7703

1955	1960	1965	
tac gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala 1970	1975	1980	7751
cac gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc His Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr 1985	1990	1995	7799
acc ccc ctt gcg cggt gct gcg tgg gag aca gct aga cac act cca gtc Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val 2000	2005	2010	7847
aat tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca Asn Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala 2020	2025	2030	7895
agg atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa Arg Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu 2035	2040	2045	7943
caa ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc Gln Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser 2050	2055	2060	7991
att gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt Ile Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu 2065	2070	2075	8039
agc gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val 2080	2085	2090	8087
gct tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga Ala Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg 2100	2105	2110	8135
cat cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Arg 2115	2120	2125	8183
gct gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag Ala Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys 2130	2135	2140	8231
ctc aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc Leu Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser 2145	2150	2155	8279
tgg ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct Trp Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser 2160	2165	2170	8327
cgt gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta			8375

Arg	Ala	Arg	Pro	Arg	Trp	Phe	Met	Trp	Cys	Leu	Leu	Leu	Ser	Val
2180								2185					2190	

ggg gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8428
 Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg *
 2195 2200

ggccaatagg ccatcctgtt ttttccctt ttttttttc tttttttttt tttttttttt 8488
 tttttttttt ttttccttctt tttttttccctt ctttttttccctt tttttttttccctt tttgggtggct 8548
 ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg actgcagaga 8608
 gtgctgatac tggcctctctt gcagatcaag t 8639

<210> 2
<211> 8642
<212> DNA
<213> HCV

<220>
<221> CDS
<222> (1802)....(8407)

<221> variation
<222> 6268
<223> r = a or g

<221> variation
<222> 4446
<223> r = a or g

<400> 2
accagccccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg 60
tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120
ccccccctccc gggagagcca tagtggctcg cggaaaccggg gatgacaccg gaattgcac 180
gacgaccggg tcctttcttg gatcaacccg ctcacatgcct ggagatttgg gcgtgcccc 240
gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggact gcctgatagg 300
gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 360
ctcaaagaaa aaccaaaggg cgccatgat ttgaaacaaga tggattgcac gcagggttctc 420
cgcccgcttgc ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct 480
ctgatgcgc cgtgttccgg ctgtcagcgc aggggcgcggc gttttttt gtcaagaccg 540
acctgtccgg tgcctgtat gaaactgcagg acgaggcagc gcccgtatcg tggctggcca 600
cgacggcggt tccttgcga gctgtgtcg acgttgcac tgaagcggga agggactggc 660
tgctattggg cgaagtgcgc gggcaggatc tcctgtcatac tcaccctgct cctgcccaga 720
aagtatccat catggctgtat gcaatgcgc ggctgcatac gcttgatccg gctacctgcc 780
cattcgacca ccaagcgaaa catcgatcg agcgagcacg tactcgatg gaagccgtc 840
ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgcgcgcgc gaaactgttcg 900
ccaggctcaa ggccgcgcgc cccgacggcg aggatctcg ctgtgaccat ggcgtatgcct 960
gcttgcggaa tatacatgggt gaaaatggcc gctttctgg attcatcgac tggccggc 1020
tgggtgtggc ggaccgctat caggacatcg cgtggctac ccgtgatatt gctgaagagc 1080
ttggccggcga atgggctgac ctgttgcgc tgcgttacgg tategcgcgt cccgattcgc 1140
agcgcatgc cttctatcgc cttcttgac agttttctg agttcgcgc cagatgtaa 1200
cagaccacaa cgggttccctt ctgcggat caattccgc ccccccccta acgttactgg 1260
ccgaagccgc ttgaaataag gcccgtgtc gtttgcatac atgttatttt ccaccatatt 1320
ggcgctttt ggcaatgtga gggccggaa acctggccctt gtcttcttgc cgagcatcc 1380
taggggtctt tccctctcg ccaaaggaaat gcaaggctgtg ttgaatgtcg tgaaggaagc 1440
agttcctctg gaagacaaac aacgtctgtt ggcaccctt gcaggcagcg 1500

gaaccccca cctggcgaca ggtgcctctg cggccaaaag ccacgttat aagatacacc 1560
 tgcaaaggcg gcacaacccc agtgcacgt tgcgttgg atagttgtgg aaagagtcaa 1620
 atggctctcc tcaagcgtat tcaacaaggg gctgaaggat gcccagaagg tacccttgc 1680
 tatggatct gatctggggc ctcggcac atgcattaca tgcgtttgt cgaggtaaa 1740
 aaacgtctag gccccccgaa ccacggggac gtggtttcc tttgaaaaac acgataatac 1800
 c atg gac cgg gag atg gca gca tgc tgc gga ggc gcg gtt ttc gta ggt 1849
 Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly
 1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
 Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
 20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945
 Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
 35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993
 Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
 50 55 60

atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc 2041
 Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
 65 70 75 80

aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt 2089
 Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
 85 90 95

ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca 2137
 Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
 100 105 110

tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct 2185
 Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
 115 120 125

ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc 2233
 Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
 130 135 140

acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg 2281
 Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
 145 150 155 160

gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc 2329
 Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
 165 170 175

tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc 2377
 Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
 180 185 190

gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc 2425
 Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser

195	200	205	
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210	215	220	2473
caa cag acg cga ggc cta ctt ggc tgc atc atc act acg ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225	230	235	2521
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245	250	255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260	265	270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275	280	285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290	295	300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305	310	315	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325	330	335	2809
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340	345	350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355	360	365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370	375	380	2953
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val 385	390	395	3001
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val 405	410	415	3049
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg			3097

Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro			
420	425	430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc			3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser			
435	440	445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt			3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly			
450	455	460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc			3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala			
465	470	475	480
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc			3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys			
485	490	495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act			3337
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr			
500	505	510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag			3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu			
515	520	525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga			3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly			
530	535	540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc			3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser			
545	550	555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc			3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile			
565	570	575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat			3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat			3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
595	600	605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att			3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
610	615	620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac			3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640

tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser 645 650 655	3769
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala 660 665 670	3817
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly 675 680 685	3865
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp 690 695 700	3913
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgg gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720	3961
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735	4009
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val 740 745 750	4057
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765	4105
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780	4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800	4201
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815	4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820 825 830	4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845	4345
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860	4393

tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc	4441
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser	
865 870 875 880	
gga arg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc	4489
Gly Xaa Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe	
885 890 895	
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga	4537
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly	
900 905 910	
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa	4585
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln	
915 920 925	
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag	4633
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys	
930 935 940	
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc	4681
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile	
945 950 955 960	
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc	4729
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro	
965 970 975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc	4777
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu	
980 985 990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc	4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala	
995 1000 1005	
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc	4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly	
1010 1015 1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg	4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val	
1025 1030 1035 1040	
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc	4969
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala	
1045 1050 1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac	5017
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn	
1060 1065 1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg	5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	

1075	1080	1085	
tgc gca gcg ata ctg cgt cg ^g cac gtg ggc cca ggg gag ggg gct gtg Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val 1090	1095	1100	5113
cag tgg atg aac cg ^g ctg ata gc ^g ttc gct tcg cg ^g ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105	1110	1115	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr 1125	1130	1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140	1145	1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155	1160	1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr 1170	1175	1180	5353
tgg ctc cag tcc aag ctc ctg cc ^g cga ttg cc ^g gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185	1190	1195	5401
tca tgt caa cgt ggg tac aag gga gtc tgg cc ^g ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205	1210	1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220	1225	1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235	1240	1245	5545
gga aca ttc ccc att aac gc ^g tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser 1250	1255	1260	5593
ccg gc ^g cca aat tat tct agg gc ^g ctg tgg cc ^g gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265	1270	1275	5641
tac gtg gag gtt acg cg ^g gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285	1290	1295	5689
acc act gac aac gta aag tgc cc ^g tgt cag gtt cc ^g gcc ccc gaa ttc			5737

Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe	
1300																1310
ttc aca gaa gtg gat ggg gtg cggttgcacagg tac gct cca gcg tgc															5785	
Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	Cys	
1315																1325
aaa ccc ctc cta cgg gag gag gtc aca ttc ctggtcgggctcaatcaa															5833	
Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	Gln	
1330																1340
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca															5881	
Tyr	Leu	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	Ala	
1345																1360
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg															5929	
Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	Thr	
1365																1375
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttggcc agc tca															5977	
Ala	Lys	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Leu	Ala	Ser	Ser	
1380																1390
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc															6025	
Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	Thr	
1395																1405
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctgtgg															6073	
Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	Trp	
1410																1420
cggttgcggatggcggaaatcacccgatgtggatgttcaaaatgg															6121	
Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	Lys	
1425																1440
gta gta att ttg gac tct ttc gag ccgttgcacaaatggatggatggatgg															6169	
Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	Glu	
1445																1455
agg gaa gta tcc gtt ccg gcg gag atc ctgcggagg tcc agg aaa ttca															6217	
Arg	Glu	Val	Ser	Val	Pro	Ala	Glu	Ile	Leu	Arg	Arg	Ser	Arg	Lys	Phe	
1460																1470
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg															6265	
Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	Leu	
1475																1485
ttr gag tcc tgg aag gac ccg gac tac gtc cct cca gtgtatcacgg															6313	
Xaa	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	Gly	
1490																1500
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca ccggagg															6361	
Cys	Pro	Leu	Pro	Pro	Ala	Lys	Ala	Pro	Pro	Ile	Pro	Pro	Pro	Arg	Arg	
1505																1520

aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525 1530 1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540 1545 1550	6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555 1560 1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570 1575 1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585 1590 1595 1600	6601
gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605 1610 1615	6649
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620 1625 1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635 1640 1645	6745
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650 1655 1660	6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665 1670 1675 1680	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685 1690 1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly 1700 1705 1710	6937
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His 1715 1720 1725	6985
atc cgc tcc gtg tgg aag gac ttg .ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile 1730 1735 1740	7033

gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag	7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	
1745 1750 1755 1760	
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg	7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
1765 1770 1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc	7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
1780 1785 1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
1795 1800 1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct	7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
1810 1815 1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
1825 1830 1835 1840	
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc	7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845 1850 1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860 1865 1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875 1880 1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca	7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890 1895 1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905 1910 1915 1920	
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925 1930 1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940 1945 1950	
atg act aga tac tct gcc ccc cct ggg gac cgc ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	

1955	1960	1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970	1975	1980	7753
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985	1990	1995	7801
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005	2010	2015	7849
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020	2025	2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035	2040	2045	7945
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050	2055	2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065	2070	2075	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085	2090	2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100	2105	2110	8137
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Arg Ala 2115	2120	2125	8185
gcc act tgt ggc aag tac ctc ttc aac ttg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130	2135	2140	8233
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145	2150	2155	8281
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165	2170	2175	8329
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg			8377

Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly		
2180	2185	2190
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca		8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *		
2195	2200	
ggccaatagg ccatcctgtt ttttccctt tttttttt ttttttttc ttttttttt 8487		
ttttttttt ttttttttc tcctttttt tcctctttt ttccctttct ttccctttgt 8547		
ggctccatct tagccctagt cacggctagc tgtgaaaggt ccgtgagccg cttgactgca 8607		
gagagtgcgtg atactggcct ctctgcagat caagt		8642
<210> 3		
<211> 2201		
<212> PRT		
<213> HCV		
<220>		
<221> VARIANT		
<222> 882		
<223> Xaa is Lys or Arg		
<221> VARIANT		
<222> 1489		
<223> Xaa is Leu		
<400> 3		
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly		
1 5 10 15		
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg		
20 25 30		
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu		
35 40 45		
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val		
50 55 60		
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr		
65 70 75 80		
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly		
85 90 95		
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala		
100 105 110		
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala		
115 120 125		
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu		
130 135 140		
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val		
145 150 155 160		
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr		
165 170 175		
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro		
180 185 190		
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser		
195 200 205		
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser		
210 215 220		

Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
 225 230 235 240
 Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
 245 250 255
 Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
 260 265 270
 Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
 275 280 285
 Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
 290 295 300
 Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp
 305 310 315 320
 Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
 325 330 335
 Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
 340 345 350
 Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
 355 360 365
 Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
 370 375 380
 Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val
 385 390 395 400
 Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val
 405 410 415
 Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro
 420 425 430
 Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser
 435 440 445
 Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly
 450 455 460
 Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala
 465 470 475 480
 Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys
 485 490 495
 Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr
 500 505 510
 Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu
 515 520 525
 Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly
 530 535 540
 Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser
 545 550 555 560
 Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile
 565 570 575
 Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp
 580 585 590
 Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr
 595 600 605
 Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile
 610 615 620
 Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp
 625 630 635 640
 Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser
 645 650 655
 Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala

660	665	670	
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
675	680	685	
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp			
690	695	700	
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu			
705	710	715	720
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr			
725	730	735	
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val			
740	745	750	
Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys			
755	760	765	
Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val			
770	775	780	
Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys			
785	790	795	800
Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu			
805	810	815	
Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile			
820	825	830	
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr			
835	840	845	
Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr			
850	855	860	
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser			
865	870	875	880
Gly Xaa Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe			
885	890	895	
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly			
900	905	910	
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln			
915	920	925	
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys			
930	935	940	
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile			
945	950	955	960
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro			
965	970	975	
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
980	985	990	
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala			
1045	1050	1055	
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
1075	1080	1085	
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	

Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val
 1105 1110 1115 1120
 Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr
 1125 1130 1135
 Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His
 1140 1145 1150
 Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu
 1155 1160 1165
 Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr
 1170 1175 1180
 Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe
 1185 1190 1195 1200
 Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met
 1205 1210 1215
 Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn
 1220 1225 1230
 Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His
 1235 1240 1245
 Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser
 1250 1255 1260
 Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu
 1265 1270 1275 1280
 Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met
 1285 1290 1295
 Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe
 1300 1305 1310
 Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys
 1315 1320 1325
 Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln
 1330 1335 1340
 Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala
 1345 1350 1355 1360
 Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr
 1365 1370 1375
 Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser
 1380 1385 1390
 Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr
 1395 1400 1405
 Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp
 1410 1415 1420
 Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys
 1425 1430 1435 1440
 Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu
 1445 1450 1455
 Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe
 1460 1465 1470
 Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu
 1475 1480 1485
 Xaa Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly
 1490 1495 1500
 Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg
 1505 1510 1515 1520
 Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala
 1525 1530 1535
 Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp

1540	1545	1550
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp		
1555	1560	1565
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly		
1570	1575	1580
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser		
1585	1590	1595
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp		1600
1605	1610	1615
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro		
1620	1625	1630
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr		
1635	1640	1645
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe		
1650	1655	1660
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu		
1665	1670	1675
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu		1680
1685	1690	1695
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly		
1700	1705	1710
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His		
1715	1720	1725
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile		
1730	1735	1740
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu		
1745	1750	1755
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly		
1765	1770	1775
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu		
1780	1785	1790
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly		
1795	1800	1805
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro		
1810	1815	1820
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu		
1825	1830	1835
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala		1840
1845	1850	1855
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile		
1860	1865	1870
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg		
1875	1880	1885
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr		
1890	1895	1900
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp		
1905	1910	1915
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser		1920
1925	1930	1935
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala		
1940	1945	1950
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr		
1955	1960	1965
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His		
1970	1975	1980

Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr
 1985 1990 1995 2000
 Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn
 2005 2010 2015
 Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg
 2020 2025 2030
 Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln
 2035 2040 2045
 Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile
 2050 2055 2060
 Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser
 2065 2070 2075 2080
 Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala
 2085 2090 2095
 Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His
 2100 2105 2110
 Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala
 2115 2120 2125
 Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu
 2130 2135 2140
 Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp
 2145 2150 2155 2160
 Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg
 2165 2170 2175
 Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
 2180 2185 2190
 Val Gly Ile Tyr Leu Leu Pro Asn Arg
 2195 2200

<210> 4
 <211> 8643
 <212> DNA
 <213> HCV

<220>
 <221> CDS
 <222> (1802)....(8407)

<400> 4
 accagccccc gattgggggc gacactccac catagatcac tccccctgtga ggaactactg 60
 tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccagac 120
 ccccccctccc gggagagcca tagtggtctg cggaaaccggg gactacaccg gaattgcag 180
 gacgaccggg tcctttcttg gatcaacccg ctcatacgct ggagatttgg gcgtgcccc 240
 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtgttact gcctgatagg 300
 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 360
 ctcaaagaaa aaccaaaggg cgccatgatgatgaa tggattgcac gcaggtttc 420
 cggccgcttg ggtggagagg ctattcgct atgactgggc gcaacagaca atcggctgct 480
 ctgatgcgc cgtgttccgg ctgtcagcgc agggcgccc ggttctttt gtcaagaccg 540
 acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggtatcg tggctggcca 600
 cgacgggcgt tccttgcga gctgtgcgt acgttgcac tgaagcggga agggactggc 660
 tgctattggg cgaagtgcgc gggcaggatc tcctgtcata tcacattgtc cctgcccaga 720
 aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc 780
 cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcgatg gaagccggc 840
 ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcccgagcc gaactgttcg 900

ccaggctcaa	ggcgccatg	cccgacggcg	aggatctcg	cgtgacccat	ggcgatgcct	960										
gcttgcgaa	tatcatggtg	gaaaatggcc	gctttctgg	attcatcgac	tgtggccggc	1020										
tgggtgtggc	ggaccgctat	caggacatag	cgttggctac	ccgtgatatt	gctgaagagc	1080										
ttggcggcga	atgggctgac	cgcttcctcg	tgcttacgg	tatcgccgct	cccgattcgc	1140										
agcgcatcgc	cttctatcgc	cttcttgacg	agttcttctg	agttcgcgcc	cagatgtaa	1200										
cagaccacaa	cgttccct	ctagcgggat	caattccgccc	ccccccctca	acgttactgg	1260										
ccgaagccgc	ttgaataaag	gccggtgtgc	gtttgtctat	atgttatttt	ccacccatatt	1320										
gccgtcttt	ggcaatgtga	gggccccgaa	acctggccct	gtcttcttga	cgagcatcc	1380										
taggggtctt	tcccctctcg	ccaaaggaaat	gcaaggctctg	ttgaatgtcg	tgaaggaagc	1440										
agttcctctg	gaagcttctt	gaagacaaac	aacgtctgt	gcgacccttt	gcagggcagcg	1500										
gaacccccc	cctggcgaca	ggtgcctctg	cggccaaaag	ccacgtgtat	aagatacaccc	1560										
tgcaaagcgc	gcacaacccc	agtgcacgt	tgtgagttgg	atagttgtgg	aaagagtcaa	1620										
atggctctcc	tcaagctat	tcaacaaggg	gctgaaggat	gcccagaagg	taccccattg	1680										
tatgggatct	gatctggggc	ctcgggtcac	atgcttaca	tgtgtttagt	cgaggttaga	1740										
aaacgtctag	gccccccgaa	ccacggggac	gtgggtttcc	tttggaaaaac	acgataatac	1800										
c atg gac	cgg gag atg	gca gca tcg	tgc gga ggc	gct ttc gta	ggt 1849											
Met	Asp	Arg	Glu	Met	Ala	Ala	Ser	Cys	Gly	Gly	Ala	Val	Phe	Val	Gly	
1		5			10						15					
ctg	ata	ctc	ttg	acc	ttg	tca	ccg	cac	tat	aag	ctg	ttc	ctc	gct	agg	1897
Leu	Ile	Leu	Leu	Thr	Leu	Ser	Pro	His	Tyr	Lys	Leu	Phe	Leu	Ala	Arg	
20		25									30					
ctc	ata	tgg	tgg	tta	caa	tat	ttt	atc	acc	agg	gcc	gag	gca	cac	ttg	1945
Leu	Ile	Trp	Trp	Leu	Gln	Tyr	Phe	Ile	Thr	Arg	Ala	Glu	Ala	His	Leu	
35		40									45					
caa	gtg	tgg	atc	ccc	ccc	ctc	aac	gtt	cgg	ggg	ggc	cgc	gat	gcc	gtc	1993
Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
50		55								60						
atc	ctc	ctc	acg	tgc	gcf	atc	cac	cca	gag	cta	atc	ttt	acc	atc	acc	2041
Ile	Leu	Leu	Thr	Cys	Ala	Ile	His	Pro	Glu	Leu	Ile	Phe	Thr	Ile	Thr	
65		70								75			80			
aaa	atc	ttg	ctc	gcc	ata	ctc	ggt	cca	ctc	atg	gtg	ctc	cag	gct	ggt	2089
Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
85		90									95					
ata	acc	aaa	gtg	ccg	tac	ttc	gtg	cgc	gca	cac	ggg	ctc	att	cgt	gca	2137
Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Gly	Leu	Ile	Arg	Ala	
100		105									110					
tgc	atg	ctg	gtg	cgg	aag	gtt	gct	ggg	ggt	cat	tat	gtc	caa	atg	gct	2185
Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	Gly	His	Tyr	Val	Gln	Met	Ala
115		120									125					
ctc	atg	aag	ttg	gcc	gca	ctg	aca	ggt	acg	tac	gtt	tat	gac	cat	ctc	2233
Leu	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	
130		135									140					
acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
145		150									155			160		

gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr 165 170 175	2329
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro 180 185 190	2377
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser 195 200 205	2425
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210 215 220	2473
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240	2521
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320	2761
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380	2953

gac ttt gta ccc gtc gag tct atg gaa acc act atg cg ^g tcc ccg gtc	3001
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val	
385 390 395 400	
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
405 410 415	
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	3097
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
420 425 430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser	
435 440 445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450 455 460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465 470 475 480	
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr	
500 505 510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515 520 525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
530 535 540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc	3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc	3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
565 570 575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat	3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580 585 590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat	3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	

595	600	605	
tac	cg	g	3673
610	615	620	
gac	g	g	
625	630	635	3721
g	g	g	
640			
645	650	655	3769
660	665	670	
g	g	g	3817
675	680	685	
690	695	700	3913
705	710	715	
720			3961
725	730	735	
740	745	750	4009
755	760	765	
770	775	780	4057
785	790	795	
790	795	800	4105
805	810	815	
810	815		4153
820	825	830	
830	835	840	4201
840	845	850	
850	855	860	4249
860	865	870	
870	875	880	4297
880	885	890	
890	895	900	
900	905	910	
910	915	920	
920	925	930	
930	935	940	
940	945	950	
950	955	960	
960	965	970	
970	975	980	
980	985	990	
990	995	1000	

Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile	820	825	830	
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg				4345
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr	835	840	845	
850	855	860		
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat				4393
Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr				
850	855	860		
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc				4441
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser	865	870	875	880
885				
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc				4489
Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe				
885	890	895		
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga				4537
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly	900	905	910	
905				
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa				4585
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln	915	920	925	
925				
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag				4633
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys	930	935	940	
935				
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc				4681
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile	945	950	955	960
955				
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc				4729
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro				
965	970	975		
975				
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc				4777
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu	980	985	990	
985				
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc				4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala	995	1000	1005	
1005				
gcc caa ctt gct cct ccc agc gct gct tcc gct ttc gta ggc gcc ggc				4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly	1010	1015	1020	
1015				
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg				4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val	1025	1030	1035	1040
1035				

gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala 1045 1050 1055	4969
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn 1060 1065 1070	5017
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val 1075 1080 1085	5065
tgc gca gcg ata ctg cgt cggt cac gtg ggc cca ggg gag ggg gct gtg Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val 1090 1095 1100	5113
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala 1170 1175 1180	5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593

ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca	5881
Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
ccg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	

1475	1480	1485	
ttg gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly 1490	1495	1500	6313
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cg agg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg 1505	1510	1515	6361
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525	1530	1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540	1545	1550	6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555	1560	1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570	1575	1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585	1590	1595	6601
gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605	1610	1615	6649
acg ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620	1625	1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635	1640	1645	6745
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650	1655	1660	6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665	1670	1675	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685	1690	1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc			6937

Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			
1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac		6985	
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			
1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att		7033	
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag		7081	
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg		7129	
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
1765	1770	1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc		7177	
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu			
1780	1785	1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga		7225	
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly			
1795	1800	1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct		7273	
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro			
1810	1815	1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag		7321	
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu			
1825.	1830	1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc		7369	
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala			
1845	1850	1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc		7417	
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile			
1860	1865	1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg		7465	
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg			
1875	1880	1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca		7513	
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr			
1890	1895	1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac		7561	
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp			
1905	1910	1915	1920

tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser 1925 1930 1935	7609
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala 1940 1945 1950	7657
atg act aga tac tct gcc ccc cct ggg gac ccc aaa cca gaa tac Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr 1955 1960 1965	7705
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 1975 1980	7753
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 1990 1995 2000	7801
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 2010 2015	7849
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 2040 2045	7945
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233

aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	2160
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	
ggccaataagg ccatcctgtt ttttcccttt tttttttttt tttttttttt tttttttttt 8487	
tttttttttt tttttttttt ttttcttttt tcccaatttt ttccttttc tttcctttgg 8547	
tggctccatc ttagccctag tcacggctag ctgtgaaagg tccgtgagcc gcttgactgc 8607	
agagagtgct gatactggcc tctctgcaga tcaagt 8643	
<210> 5	
<211> 8648	
<212> DNA	
<213> HCV	
<220>	
<221> CDS	
<222> (1802) ... (8407)	
<400> 5	
gccagccccc gattgggggc gacactccac catagatcac tccccctgtga ggaactactg 60	
tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120	
ccccccctccc gggagagcca tagtggctcg cggaaaccggg gatgacaccg gaattgcac 180	
gacgaccggg tcctttcttg gatcaacccg ctcatacgct ggagatttg 90 240	
gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgttggtact gcctgataagg 300	
gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcaccg aatcctaaac 360	
ctcaaagaaa aaccaaaggg cgcgcctatga ttgaaacaaga tggattgcac gcaggttctc 420	
cggccgcctt ggtggagagg ctattcggct atgactggc acaacagaca atcggctgct 480	
ctgatgcgc cgttccgg ctgtcagcgc aggggcgcggc ggttctttt gtcaagaccg 540	
acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 600	
cgacgggcgt tccttgcgc gctgtgcctg acgttgtcac tgaagcggga agggactggc 660	
tgctattttgg cgaagtgcgc gggcaggatc tcctgtcata tcacattgtc cctgcccaga 720	
aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc 780	
cattcgacca ccaagcgaaa catcgcatcg agcgagcaccg tactcgatg gaagccggtc 840	
ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgcctagcc gaactgttcg 900	
ccaggctcaa ggccgcgc gcccgcggc aggatctcg cgtgaccat ggcgatgcct 960	
gcttgcgaa tatacatggg gaaaatggcc gctttctgg attcatcgac tggccggc 1020	
tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1080	
ttggcggcga atgggctgac cgcttcctcg tgcttacgg tatacgccgt cccgattcgc 1140	
agcgcatcg cttctatcgc ctttttgcg agttttctg agttcgcc cagatgtaa 1200	
cagaccacaa cggttccct ctacggggat caattccgcc ccccccccta acgttactgg 1260	
ccgaagccgc ttgaaataag gccgggtgtc gtttgcctat atgttatttt ccaccatatt 1320	
gccgtctttt ggcaatgtga gggccggaa acctggccct gtcttcttga cgagcattcc 1380	

taggggtctt	tccctctcg	ccaaaggaat	gcaaggctcg	ttgaatgtcg	tgaaggaagc	1440	
agttcctctg	gaagcttctt	gaagacaac	aacgtctgt	gcgaccctt	gcagggcagcg	1500	
gaaccccca	cctggcgaca	ggtgcctctg	cggccaaag	ccacgtgtat	aagatacacc	1560	
tgcaaaggcg	gcacaacccc	agtgccacgt	tgtgagttgg	atagttgtgg	aaagagtc当地	1620	
atggctctcc	tcaagcgat	tcaacaaggg	gctgaaggat	gcccagaagg	tacccattg	1680	
tatggatct	gatctggggc	ctcggtgcac	atgcttaca	tgtgttagt	cgaggttaaa	1740	
aaacgtctag	gccccccgaa	ccacggggac	gtggtttcc	tttggaaaac	acgataatac	1800	
c atg gac	cg gag atg	gca gca	tcg tgc	gga ggc	gct ttc	gta ggt	1849
Met Asp Arg	Glu Met	Ala Ala	Ser Cys	Gly Gly	Ala Val	Phe Val Gly	
1	5	10	15				
ctg ata ctc ttg acc ttg tca	ccg cac tat aag	ctg ttc ctc	gct agg				1897
Leu Ile Leu Leu Thr Leu Ser	Pro His Tyr Lys	Leu Phe Leu Ala Arg					
20	25	30					
ctc ata tgg tgg tta caa tat	ttt atc acc agg	gcc gag	gca cac	ttg			1945
Leu Ile Trp Trp Leu Gln Tyr	Phe Ile Thr Arg	Ala Glu Ala His	Leu				
35	40	45					
caa gtg tgg atc ccc ccc	ctc aac gtt	cg ggg ggc	cgc gat	gcc gtc			1993
Gln Val Trp Ile Pro Pro	Leu Asn Val Arg	Gly Gly Arg	Arg Asp	Ala Val			
50	55	60					
atc ctc ctc acg tgc	gct atc cac cca	gag cta	atc ttt acc	atc acc			2041
Ile Leu Leu Thr Cys Ala	Ile His Pro Glu	Leu Ile Phe	Thr Ile Thr				
65	70	75	80				
aaa atc ttg ctc gcc	ata ctc ggt	cca ctc atg	gtg ctc cag	gct ggt			2089
Lys Ile Leu Ala Ile Leu	Gly Pro Leu Met	Val Leu Gln	Ala Gly				
85	90	95					
ata acc aaa gtg ccg	tac ttc gtg	cgc gca	cac ggg	ctc att	cgt gca		2137
Ile Thr Lys Val Pro	Tyr Phe Val Arg	Ala His Gly	Leu Ile Arg	Ile	Arg Ala		
100	105	110					
tgc atg ctg gtg	cg aag gtt	gct ggg	ggt cat	tat gtc	caa atg	gct	2185
Cys Met Leu Val Arg	Lys Val Ala	Gly Gly	His Tyr	Val Gln	Met Ala		
115	120	125					
ctc atg aag ttg gcc	gca ctg aca	ggt acg tac	gtt tat	gac cat	ctc		2233
Leu Met Lys Leu Ala	Ala Leu Thr	Gly Thr	Tyr Val	Tyr Asp	His Leu		
130	135	140					
acc cca ctg cgg	gac tgg gcc	cac gcg	ggc cta	cga gac	ctt gcg	gtg	2281
Thr Pro Leu Arg Asp	Trp Ala His	Ala Gly	Leu Arg	Asp Leu	Ala Val		
145	150	155	160				
gca gtt gag ccc	gtc ttc tct	gat atg	gag acc	aag gtt	atc acc		2329
Ala Val Glu Pro	Val Val Phe	Ser Asp	Met Glu	Thr Lys	Val Ile Thr		
165	170	175					
tgg ggg gca	gac acc	gct gcg	tgt ggg	gac atc	atc ttg	ggc ctg ccc	2377
Trp Gly Ala Asp	Thr Ala Ala	Cys Gly	Asp Ile	Ile Leu	Gly Leu	Pro	
180	185	190					

gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser 195 200 205	2425
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210 215 220	2473
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240	2521
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cgg ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380	2953
gac ttt gta ccc gtc gag tct atg gga acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val 385 390 395 400	3001
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val 405 410 415	3049

gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	3097
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
420 425 430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser	
435 440 445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450 455 460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465 470 475 480	
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr	
500 505 510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515 520 525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
530 535 540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc	3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc	3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
565 570 575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat	3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580 585 590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat	3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
595 600 605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att	3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610 615 620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac	3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	

625	630	635	640															
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc		3769	
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser			
645								650						655				
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg		3817	
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala			
660							665							670				
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc		3865	
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly			
675							680							685				
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cg	ccc	tcg	ggc	atg	ttc	gat		3913	
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp			
690							695							700				
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	g	gc	g	tgt	g	c	tac	gag		3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu			
705							710							715				
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cg	g	ct	ta	aa	ca		4009	
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr			
725							730							735				
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	agc	gtc		4057	
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val			
740							745							750				
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag		4105	
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys			
755							760							765				
cag	gca	gga	gac	aa	ttc	ccc	ta	ctg	gt	gca	ta	cag	gt	ac	gt		4153	
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val			
770							775							780				
tgc	gcc	agg	gct	cag	g	ct	cc	ta	tc	tgg	gac	ca	at	tgg	aag		4201	
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys			
785							790							795				
tgt	ctc	ata	cgg	cta	aag	cct	ac	ctg	ca	gg	cc	ac	cc	ctg	ctg		4249	
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu			
805							810							815				
tat	agg	ctg	gga	ggc	gtt	caa	aa	ac	gag	gtt	act	ac	ca	cc	ata		4297	
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile			
820							825							830				
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	ac		4345	
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr			
835								840						845				
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	g	tat		4393	

Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr		
850						855						860					
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc															4441		
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser		
865						870				875				880			
gga aag ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc															4489	.	
Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe		
						885			890			895					
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga															4537		
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly		
						900			905			910					
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa															4585		
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln		
						915			920			925					
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag															4633		
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys		
						930			935			940					
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc															4681		
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile		
						945			950			955			960		
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc															4729		
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro		
						965			970			975					
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc															4777		
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu		
						980			985			990					
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc															4825		
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala		
						995			1000			1005					
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc															4873		
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly		
						1010			1015			1020					
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg															4921		
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val		
						1025			1030			1035			1040		
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc															4969		
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala		
						1045			1050			1055					
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac															5017		
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn		
						1060			1065			1070					

cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg	5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
1075 1080 1085	
tgc gca gcg ata ctg cgt cggt cac gtg ggc cca ggg gag ggg gct gtg	5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val	
1090 1095 1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc	5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
1105 1110 1115 1120	
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act	5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
1125 1130 1135	
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg gta tgc acg gtg ttg act gat ttc aag acc	5353
Arg Asp Val Trp Asp Trp Val Cys Thr Val Leu Thr Asp Phe Lys Thr	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac	5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
1220 1225 1230	
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat	5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
1235 1240 1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc	5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	

acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg ccg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca	5881
Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg ccc tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cg ^g cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca ccg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	

1505	1510	1515	1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525		1530		6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540	1545			6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555	1560	1565		6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570	1575	1580		6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585	1590	1595	1600	6601
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605	1610		1615	6649
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620	1625		1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635	1640	1645		6745
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650	1655	1660		6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665	1670	1675	1680	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685	1690		1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly 1700	1705	1710		6937
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His 1715	1720	1725		6985
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att				7033

Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag			7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
1765	1770	1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc			7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu			
1780	1785	1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga			7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly			
1795	1800	1805	
cag cgg gtc gag ttc ctg gtg aat gct tgg aaa gcg aag aaa tgc cct			7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro			
1810	1815	1820	
atg ggc ttc gca tat gac acc cgc tgc ttt gac tca acg gtc act gag			7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu			
1825	1830	1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgc ttt gac ttg gcc			7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala			
1845	1850	1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc			7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile			
1860	1865	1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg			7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg			
1875	1880	1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca			7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr			
1890	1895	1900	
tgt tac ttg aag gcc gct gcg gcc tgc cga gct gcg aag ctc cag gac			7561
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp			
1905	1910	1915	1920
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgc gaa agc			7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser			
1925	1930	1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct			7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala			
1940	1945	1950	

atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr 1955 1960 1965	7705
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 1975 1980	7753
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 1990 1995 2000	7801
ccc ctt gcg cggt gct ggc tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 2010 2015	7849
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 2040 2045	7945
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cggt gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233
aaa ctc act cca atc ccg gct ggc tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160	8281
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165 2170 2175	8329

gcc cga ccc cgc tgg ttc acg tgg tgc cta ctc cta ctt tct gta ggg 8377
 Ala Arg Pro Arg Trp Phe Thr Trp Cys Leu Leu Leu Ser Val Gly
 2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427
 Val Gly Ile Tyr Leu Leu Pro Asn Arg *
 2195 2200

ggccaatagg ccatcctgtt ttttccctt tttcccttt tttttttttt tttttttttt 8487
 tttttttttt tttttttttt ttccccccct ttttccctt ttttttttcc ttttcttcc 8547
 tttggtgct ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg 8607
 actgcagaga gtgctgatac tggcctctct gtagatcaag t 8648

<210> 6
 <211> 8638
 <212> DNA
 <213> HCV

<220>
 <221> CDS
 <222> (1802) ... (8407)

<400> 6

accagccccc gattgggggc gacactccac catagatcac tccctgtga ggaactactg 60
 tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120
 ccccccctccc gggagagcca tagtggtctg cggaaaccgtt gatgacaccg gaattgcac 180
 gacgaccggg tccttcttg gatcaaccgg ctcaatgcct ggagatttg gggtgcccc 240
 gcgagactgc tagccgagta gtgtgggtc gcgaaaggcc ttgtggtaact gcctgatagg 300
 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcagc aatcctaaac 360
 ctcaaagaaa aaccaaaggg cgcgcattga ttgaaacaaga tggattgcac gcaggttctc 420
 cggccgcttg ggtggagagg ctattcggct atgactggc acaacagaca atcggctgct 480
 ctgtatgcgc cgtgttccgg ctgtcagcgc agggcgccc gggttctttt gtcaagaccg 540
 acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 600
 cgacgggctg tccttgcgc gctgtgtcg acgttgcac tgaagcggga agggactggc 660
 tgctattttgg cgaagtgcgc gggcaggatc tccgtcata tcacccctgt cctgccgaga 720
 aagtatccat catggctgat gcaatgcgc ggctgcatac gcttgcatacg gctaccgtcc 780
 cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcgatg gaagccggtc 840
 ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgcagcc gaactgttcg 900
 ccaggctcaa ggccgcgcatg cccgacggcg aggatctcg cgtgaccat ggcgatgcct 960
 gcttgcgaa tattatggtg gaaaatggcc gctttctgg attcatcgac tggccggc 1020
 tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1080
 ttggccggcga atgggctgac cgcttccctcg tgcttacgg tattcgccgt cccgattcgc 1140
 agcgcatcg cttctatcgc cttcttgacg agttcttctg agttcgcc cagatgttaa 1200
 cagaccacaa cgggttccct ctagcggat caattccgcc cccccccta acgttactgg 1260
 ccgaagccgc ttgaaataag gccgggtgtc gtttgcatacg atgttatttt ccaccatatt 1320
 gcccgtcttt ggcaatgtga gggcccgaa acctggccct gtcttctgca cgagcatcc 1380
 taggggtctt tccctctcg ccaaaggaaat gcaaggctcg ttgaaatgtcg tgaaggaagc 1440
 agttcctctg gaaacctt gaaagacaaac aacgtctgtc ggcaccctt gcaggcagcg 1500
 gaacccccc cctggcgaca ggtgcctctg cggccaaaag ccacgtgtat aagatacacc 1560
 tgcaaaggcg gcacaacccc agtgcacatgt tggatgtgg atagttgtgg aaagagtc 1620
 atggctctcc tcaagcgat tcaacaagg gctgaaggat gcccagaagg taccatcg 1680
 tatggatct gatctggggc ctcgggtgcac atgcattaca tggatgtgg cggatgtaaa 1740
 aaacgtctag gccccccgaa ccacggggac gtgggtttcc tttgaaaaac acgataatac 1800
 c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849

Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly		
1 5 10 15		
ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg	1897	
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg		
20 25 30		
ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg	1945	
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu		
35 40 45		
caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc	1993	
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val		
50 55 60		
atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc	2041	
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr		
65 70 75 80		
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt	2089	
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly		
85 90 95		
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca	2137	
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala		
100 105 110		
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct	2185	
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala		
115 120 125		
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc	2233	
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu		
130 135 140		
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt qcq qtg	2281	
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val		
145 150 155 160		
gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc	2329	
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr		
165 170 175		
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	2377	
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro		
180 185 190		
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425	
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser		
195 200 205		
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	2473	
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser		
210 215 220		

caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240	2521
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac ggc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Gly Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380	2953
gac ttt gta ccc gtc gag tct atg gga acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val 385 390 395 400	3001
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val 405 410 415	3049
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro 420 425 430	3097
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser 435 440 445	3145

gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt		3193	
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly			
450	455	460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc		3241	
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala			
465	470	475	480
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc		3289	
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys			
485	490	495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act		3337	
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr			
500	505	510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag		3385	
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu			
515	520	525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga		3433	
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly			
530	535	540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc		3481	
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser			
545	550	555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc		3529	
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile			
565	570	575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat		3577	
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat		3625	
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
595	600	605	
tac cgg ggc ctt gat gta tcc gtc ata cca act acg gga gac gtc att		3673	
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
610	615	620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac		3721	
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc acg		3769	
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser			
645	650	655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg		3817	
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala			

660	665	670	
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc			3865
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
675	680	685	
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat			3913
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp			
690	695	700	
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag			3961
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu			
705	710	715	720
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca			4009
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr			
725	730	735	
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc			4057
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val			
740	745	750	
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag			4105
Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys			
755	760	765	
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtc			4153
Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val			
770	775	780	
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag			4201
Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys			
785	790	795	800
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg			4249
Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu			
805	810	815	
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata			4297
Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile			
820	825	830	
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg			4345
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr			
835	840	845	
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat			4393
Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr			
850	855	860	
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc			4441
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser			
865	870	875	880
gga aag ccg gcc atc att ccc gac agg gaa gtc ttt tac cgg gag ttc			4489

Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Phe Tyr Arg Glu Phe			
885	890	895	
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga			4537
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly			
900	905	910	
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa			4585
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln			
915	920	925	
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag			4633
Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys			
930	935	940	
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc			4681
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile			
945	950	955	960
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc			4729
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro			
965	970	975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc			4777
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
980	985	990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc			4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
gcc caa ctt gct ccc agc gct gct tct gta ggc gcc ggc			4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg			4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc			4969
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala			
1045	1050	1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac			5017
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg			5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
1075	1080	1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg			5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	

cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr 1170 1175 1180	5353
tgg ctc cag tcc aag qtc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
cgt tcc atg agg atc gtg ggg cct agg acc tgt aac acg tgg cat Arg Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg ccg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785

aaa ccc ctc cta cg ^g gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca	5881
Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cg ^g cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gc ^g atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ctg ccg cct gcc aag gcc cct ccg ata cca cct cca ccg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
1505 1510 1515 1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
1525 1530 1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac	6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	

1540	1545	1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp			6505
1555	1560	1565	
gag ggc tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly			6553
1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg cct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Pro Trp Ser Thr Val Ser			6601
1585	1590	1595	1600
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			6649
1605	1610	1615	
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			6697
1620	1625	1630	
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			6745
1635	1640	1645	
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			6793
1650	1655	1660	
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			6841
1665	1670	1675	1680
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu			6889
1685	1690	1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			6937
1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			6985
1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			7033
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			7081
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129

Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro	Asp	Leu	Gly	
				1765				1770						1775		
gtt	cgt	gtg	tgc	gag	aaa	atg	gcc	ctt	tac	gat	gtg	gtc	tcc	acc	ctc	7177
Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val	Val	Ser	Thr	Leu	
				1780				1785					1790			
cct	cag	gcc	gtg	atg	ggc	tct	tca	tac	gga	ttc	caa	taa	tct	cct	gga	7225
Pro	Gln	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	Pro	Gly	
				1795			1800				1805					
cag	cgg	gtc	gag	tcc	ctg	gtg	aat	gcc	tgg	aaa	gca	aag	aaa	tgc	cct	7273
Gln	Arg	Val	Glu	Phe	Leu	Val	Asn	Ala	Trp	Lys	Ala	Lys	Lys	Cys	Pro	
				1810		1815			1820							
atg	ggc	tcc	gca	tat	gac	acc	cgc	tgt	ttt	gac	tca	acg	gtc	act	gag	7321
Met	Gly	Phe	Ala	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	Thr	Glu	
				1825		1830		1835		1840						
aat	gac	atc	cgt	gtt	gag	gag	tca	atc	tac	caa	tgt	tgt	gac	ttg	gcc	7369
Asn	Asp	Ile	Arg	Val	Glu	Glu	Ser	Ile	Tyr	Gln	Cys	Cys	Asp	Leu	Ala	
				1845		1850		1855								
ccc	gaa	gcc	aga	cag	gcc	ata	agg	tcc	ctc	aca	gag	cg	ctt	ta	atc	7417
Pro	Glu	Ala	Arg	Gln	Ala	Ile	Arg	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Ile	
				1860		1865		1870								
ggg	ggc	ccc	ctg	act	aat	tct	aaa	ggg	cag	aac	tgc	ggc	tat	cgc	cg	7465
Gly	Gly	Pro	Leu	Thr	Asn	Ser	Lys	Gly	Gln	Asn	Cys	Gly	Tyr	Arg	Arg	
				1875		1880		1885								
tgc	cgc	gag	gtt	gta	ctg	acg	acc	agc	tgc	ggt	aat	acc	ctc	aca		7513
Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	Leu	Thr	
				1890		1895		1900								
tgt	ta	ttg	aag	gcc	gct	gct	gct	cg	g	g	aa	cc	tc	ca	g	7561
Cys	Tyr	Leu	Lys	Ala	Ala	Ala	Ala	Cys	Arg	Ala	Ala	Lys	Leu	Gln	Asp	
				1905		1910		1915		1920						
tgc	acg	atc	ctc	gta	tgc	gga	gac	gac	ctt	gtc	gtt	atc	tgt	gaa	agc	7609
Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Cys	Glu	Ser	
				1925		1930		1935								
gcg	ggg	acc	caa	gag	gac	gag	gac	gac	cta	cg	gg	ttc	ac	gag	gct	7657
Ala	Gly	Thr	Gln	Glu	Asp	Glu	Ala	Ser	Leu	Arg	Ala	Phe	Thr	Glu	Ala	
				1940		1945		1950								
atg	act	aga	tac	tct	gcc	ccc	cct	ggg	gac	ccg	ccc	aaa	cca	gaa	tac	7705
Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Lys	Pro	Glu	Tyr	
				1955		1960		1965								
gac	ttg	gag	ttg	ata	aca	tca	tgc	tcc	aat	gtg	tca	gtc	g	c	ac	7753
Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	Ala	His	
				1970		1975		1980								

gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cggt gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cggt gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	

ggccaatagg ccatcctgtt tttttttttt tttttttttt tttttttttt tttttttttt 8487
 tttttttttt tttttttttt ttttttcctc ttttttttcc ttttcttcc tttgggtggct 8547
 ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgctg actgcagaga 8607
 gtgctgatac tggcctctct gcagatcaag t 8638

<210> 7
 <211> 8638
 <212> DNA
 <213> HCV

<220>
 <221> CDS
 <222> (1802) ... (8407)

<400> 7
 gccagccccc gattggggc gacactccac catagatcac tccctgtga ggaactactg 60
 tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120
 ccccccctccc gggagagcca tagtggctcg cggaaaccggt gactacaccg gaattgcccag 180
 gacgaccggg tccttcttg gatcaaccgg ctcatacgctt ggagatttgg gcgtgcccc 240
 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtaact gcctgatagg 300
 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcagc aatcctaaac 360
 ctcaaagaaa aaccaaaggg cgcgcattga ttgaaacaaga tggattgcac gcaggttctc 420
 cggccgcttgc ggtggagagg ctattcggtc atgactggc acaacagaca atcggctgct 480
 ctgatgcccgc cgtgttccgg ctgtcagcgc agggggcgccc ggttttttt gtcaagaccg 540
 acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 600
 cgacgggggt tccttgcgc gctgtctcg acgttgcac tgaagcggga agggactggc 660
 tgctatttggg cgaagtgcgc gggcaggatc tcctgtcattc tcaccttgc cctgcccaga 720
 aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgcattcg gctacctgccc 780
 cattcgacca ccaagcgaaa catcgcatcg agcgagcagc tactcggatg gaagccggc 840
 ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgcagcc gaactgttcg 900
 ccaggctcaa ggccgcgcgc cccgacggcg aggatctcg cgtgaccat ggcgatgcct 960
 gcttgcgaa tattatgggtg gaaaatggcc gctttctgg attcatcgac tggccggc 1020
 tgggtgtggc ggaccgctat caggacatag cggtggctac ccgtgatatt gctgaagagc 1080
 ttggcggcga atgggctgac cgcttctcg tgctttacgg tattcgccct cccgattcgc 1140
 agcgcatcg cttctatcgc tttttgcac agttttctg agttcgcc cagatgttaa 1200
 cagaccacaa cgggttccct ctagcggat caattccgccc cccccccta acgttactgg 1260
 ccgaagccgc ttgaaataag gccgggtgtc gtttgcattat atgttatttt ccaccatatt 1320
 gccgtctttt ggcattgtga gggccggaa acctggccct gtcttctga cgagcattcc 1380
 taggggtctt tcccctctcg ccaaaggaaat gcaaggctcg ttgaaatgtcg tgaaggaagc 1440
 agttcctctg gaagcttctt gaagacaaac aacgtctgtc gcgaccctt gcaggcagcg 1500
 gaaccccccga cctggcgaca ggtgcctctg cggccaaaag ccacgtgtat aagatacacc 1560
 tgcaaaggcg gcacaacccc agtgcacgt tgcgttgg atagttgtgg aaagagtc 1620
 atggctctcc tcaagcgat tcaacaaggg gctgaaggat gcccagaagg taccatcg 1680
 tatggatct gatctggggc ctcgggtgcac atgcattaca tgcgtttagt cgaggtaaa 1740
 aaacgtctag gccccccgaa ccacggggac gtggtttcc tttgaaaaac acgataatac 1800
 c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849
 Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly

1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897
 Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg
 20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945

Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu			
35	40	45	
caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc			1993
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val			
50	55	60	
atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc			2041
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr			
65	70	75	80
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt			2089
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly			
85	90	95	
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca			2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala			
100	105	110	
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct			2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala			
115	120	125	
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc			2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu			
130	135	140	
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg			2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val			
145	150	155	160
gca gtt gag ccc gtc ttc tct gat atg gag acc aag gtt atc acc			2329
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr			
165	170	175	
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc			2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro			
180	185	190	
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc			2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser			
195	200	205	
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc			2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser			
210	215	220	
caa cag acg cga ggc cta ctt ggc tgc atc atc acc agc ctc aca ggc			2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly			
225	230	235	240
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca			2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala			
245	250	255	

aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617		
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val			
260	265	270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665		
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile			
275	280	285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713		
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala			
290	295	300	
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	2761		
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp			
305	310	315	320
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cgg cgg	2809		
Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg			
325	330	335	
ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg	2857		
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu			
340	345	350	
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	2905		
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val			
355	360	365	
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg	2953		
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val			
370	375	380	
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc	3001		
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val			
385	390	395	400
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049		
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val			
405	410	415	
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	3097		
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro			
420	425	430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145		
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser			
435	440	445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193		
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly			
450	455	460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241		
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala			
465	470	475	480

ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys 485 490 495	3289
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr 500 505 510	3337
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu 515 520 525	3385
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly 530 535 540	3433
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser 545 550 555 560	3481
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile 565 570 575	3529
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp 580 585 590	3577
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr 595 600 605	3625
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile 610 615 620	3673
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp 625 630 635 640	3721
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser 645 650 655	3769
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala 660 665 670	3817
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly 675 680 685	3865
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp	3913

690	695	700	
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720			3961
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735			4009
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val 740 745 750			4057
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765			4105
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780			4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800			4201
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815			4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820 825 830			4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845			4345
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gct gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860			4393
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865 870 875 880			4441
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe 885 890 895			4489
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900 905 910			4537
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa			4585

Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln			
915	920	925	
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag		4633	
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys			
930	935	940	
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc		4681	
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile			
945	950	955	960
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc		4729	
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro			
965	970	975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc		4777	
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
980	985	990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc		4825	
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
gcc caa ctt gct cct ccc agc gct gct tcc gct ttc gta ggc gcc ggc		4873	
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg		4921	
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc		4969	
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala			
1045	1050	1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac		5017	
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
cta ctc cct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg		5065	
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
1075	1080	1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg		5113	
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc		5161	
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val			
1105	1110	1115	1120
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act		5209	
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr			
1125	1130	1135	

cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala 1170 1175 1180	5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg ccg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg ccg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln 1330 1335 1340	5833
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala 1345 1350 1355 1360	5881

gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cg ^g cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gc ^g gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gc ^g gag atc ctg cgg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gc ^g atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gc ^g aag gc ^g cct ccg ata cca cct cca cgg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
1505 1510 1515 1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gc ^g ttg gc ^g	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
1525 1530 1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gc ^g gtc gac	6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	
1540 1545 1550	
agc ggc acg gca acg gc ^g tct cct gac cag ccc tcc gac gac ggc gac	6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	
1555 1560 1565	
gc ^g gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag ggg	6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	

1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585	1590	1595	6601
1600			
gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605	1610	1615	6649
1620	1625	1630	6697
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1625	1630	1635	
1635	1640	1645	6745
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635	1640	1645	
1650	1655	1660	6793
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650	1655	1660	
1665	1670	1675	6841
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665	1670	1675	
1675	1680	1685	
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685	1690	1695	6889
1695			
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro His Ser Ala Arg Ser Lys Phe Gly 1700	1705	1710	6937
1705	1710	1715	
1715	1720	1725	6985
1725			
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile 1730	1735	1740	7033
1735	1740	1745	
1745	1750	1755	7081
1755	1760	1765	
1765	1770	1775	7129
1775			
1780	1785	1790	7177
1790			
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga 1785	1790	1795	7225
1795			

Pro	Gln	Ala	Val	Met	Gly	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	Pro	Gly	1795	1800	1805		
cag	cg	gtc	gag	ttc	ctg	gtg	aat	gcc	tgg	aaa	g	a	g	aaa	tgc	cct		7273	
Gln	Arg	Val	Glu	Phe	Leu	Val	Asn	Ala	Trp	Lys	Ala	Lys	Lys	Cys	Pro				
1810															1820				
atg	ggc	ttc	gca	tat	gac	acc	cgc	tgt	ttt	gac	tca	acg	gtc	act	gag			7321	
Met	Gly	Phe	Ala	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	Thr	Glu				
1825															1830	1835	1840		
aat	gac	atc	cgt	gtt	gag	gag	tca	atc	tac	caa	tgt	tgt	gac	ttg	gcc			7369	
Asn	Asp	Ile	Arg	Val	Glu	Glu	Ser	Ile	Tyr	Gln	Cys	Cys	Asp	Leu	Ala				
															1845	1850	1855		
ccc	gaa	gcc	aga	cag	gcc	ata	agg	tcg	ctc	aca	gag	cgg	ctt	tac	atc			7417	
Pro	Glu	Ala	Arg	Gln	Ala	Ile	Arg	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Ile				
															1860	1865	1870		
ggg	ggc	ccc	ctg	act	aat	tct	aaa	ggg	cag	aac	tgc	ggc	tat	cgc	cgg			7465	
Gly	Gly	Pro	Leu	Thr	Asn	Ser	Lys	Gly	Gln	Asn	Cys	Gly	Tyr	Arg	Arg				
															1875	1880	1885		
tgc	cgc	g	gc	g	gt	ct	g	ac	g	ac	tgc	g	gt	aat	ac	ctc	ac		7513
Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	Leu	Thr				
															1890	1895	1900		
tgt	tac	ttg	aag	gcc	gct	g	cg	g	t	c	g	a	g	ctc	c	g	ac		7561
Cys	Tyr	Leu	Lys	Ala	Ala	Ala	Cys	Arg	Ala	Ala	Lys	Leu	Gln	Asp					
															1905	1910	1915	1920	
tgc	ac	atg	ctc	gt	ta	tgc	g	ga	g	ac	ct	g	t	atc	tgt	gaa	agc		7609
Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Cys	Glu	Ser				
															1925	1930	1935		
g	cg	gg	ac	ca	ga	g	ac	g	g	g	c	g	cc	tt	ac	g	g		7657
Ala	Gly	Thr	Gln	Glu	Asp	Glu	Ala	Ser	Leu	Arg	Ala	Phe	Thr	Glu	Ala				
															1940	1945	1950		
atg	act	aga	ta	c	t	cc	c	c	gg	g	ac	cc	cc	aa	cc	aa	ta		7705
Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Lys	Pro	Glu	Tyr				
															1955	1960	1965		
gac	ttg	gag	ttg	at	aca	tca	tgc	tcc	tcc	aat	gt	tca	gtc	g	c	cac			7753
Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	Ala	His				
															1970	1975	1980		
gat	gca	tct	ggc	aaa	agg	gt	ta	c	tc	ac	cgt	gac	cc	ac	cc			7801	
Asp	Ala	Ser	Gly	Lys	Arg	Val	Tyr	Tyr	Leu	Thr	Arg	Asp	Pro	Thr	Thr				
															1985	1990	1995	2000	
ccc	ctt	gc	cg	g	ct	gc	tg	ga	ac	g	ct	ag	ca	ac	cc	gt	aat		7849
Pro	Leu	Ala	Arg	Ala	Ala	Trp	Glu	Thr	Ala	Arg	His	Thr	Pro	Val	Asn				
															2005	2010	2015		

tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 2040 2045	7945
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160	8281
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165 2170 2175	8329
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly 2180 2185 2190	8377
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca Val Gly Ile Tyr Leu Leu Pro Asn Arg * 2195 2200	8427
ggccaatagg ccattcctgtt tttttccctt ttttttttc tttttttttt tttttttttt 8487 ttttttttt ttttctcctt ttttttcctt cttttttcc tttttttcc tttttttcc tttgggtggct 8547 ccatcttagc cctagtcacg gctagctgt aaaggtccgt gagccgcttg actgcagaga 8607 gtgctgatac tggcctctct gca gatcaag t	8638

<210> 8
<211> 6

<212> DNA		
<213> HCV		
<400> 8		6
accagc		
<210> 9		
<211> 63		
<212> DNA		
<213> HCV		
<400> 9		
gaattccaga tggcgcgccc agatgttaac cagatccatg gcacactcta gagtactgtc	60	
gac	63	
<210> 10		
<211> 33		
<212> DNA		
<213> HCV		
<400> 10		33
cggaatcggtt aacagaccac aacggtttcc ctc		
<210> 11		
<211> 30		
<212> DNA		
<213> HCV		
<400> 11		
ggcgtaccca tggatttac gtgttttca	30	
<210> 12		
<211> 45		
<212> DNA		
<213> HCV		
<400> 12		45
gcataatgaat tctaatacga ctcactatacg gccagcccc gattg		
<210> 13		
<211> 45		
<212> DNA		
<213> HCV		
<400> 13		
ggcgccct ttggttttc tttgaggttt aggattcgtg ctcat	45	
<210> 14		
<211> 36		
<212> DNA		
<213> HCV		
<400> 14		36
aaaggcgca tgattgaaca agatggattg cacgca		

<210> 15		
<211> 39		
<212> DNA		
<213> HCV		
<400> 15		
gcatatgtta actcagaaga actcgtcaag aaggcgata		39
<210> 16		
<211> 45		
<212> DNA		
<213> HCV		
<400> 16		
gcatatgaat tctaatacga ctcactatacg gccagcccc gattg		45
<210> 17		
<211> 30		
<212> DNA		
<213> HCV		
<400> 17		
acgcagaaag cgtctagcca tggcgtagt		30
<210> 18		
<211> 30		
<212> DNA		
<213> HCV		
<400> 18		
tcccggggca ctcgcaagca ccctatcagg		30
<210> 19		
<211> 26		
<212> DNA		
<213> HCV		
<220>		
<223> Label with FAM: fluorescence reporter dye		
<223> Label with TAMRA: Quencher dye		
<400> 19		
tggtctgcgg aacgggtgag tacacc		26
<210> 20		
<211> 45		
<212> DNA		
<213> HCV		
<400> 20		
gtggacgaat tctaatacga ctcactataa ccagcccccg attgg		45
<210> 21		
<211> 27		

<212> DNA
 <213> HCV

 <400> 21
 ggaacgccccg tcgtggccag ccacgat 27

 <210> 22
 <211> 23
 <212> DNA
 <213> HCV

 <400> 22
 gtcgtctct ctgacatgga gac 23

 <210> 23
 <211> 27
 <212> DNA
 <213> HCV

 <400> 23
 gagttgctca gtggattgat gggcagc 27

 <210> 24
 <211> 8638
 <212> DNA
 <213> HCV

 <220>
 <221> CDS
 <222> (1802) ... (8407)

 <400> 24
 accagccccc gattgggggc gacactccac catagatcac tccccgtgta ggaactactg 60
 tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120
 ccccccctccc gggagagcca tagtggctcg cggaaaccggg gactacaccg gaattgcac 180
 gacgaccggg tccttcttg gatcaacccg ctcaatgcct ggagattgg gctgtcccc 240
 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtaact gcctgataagg 300
 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcaccg aatcctaaac 360
 ctcaaagaaa aaccaaaggg cgccatgta ttgaaacaaga tggattgcac gcaggttctc 420
 cggccgcttgc ggtggagagg ctattcggct atgactggc acaacagaca atcggctgct 480
 ctgatgcgcg cgttccgg ctgtcagcgc agggcgccc gttttttt gtcaagaccg 540
 acctgtccgg tgcctgaaat gaaatgcagg acgaggcagc gcggctatcg tggctggcca 600
 cgacggcggt tccttgcga gctgtgcgt acgttgcac tgaagcggga agggactggc 660
 tgctattggg cgaagtgcgcg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga 720
 aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc 780
 cattcgacca ccaagcgaaa catcgcatcg agcgagcaccg tactcgatg gaagccggtc 840
 ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcggcagcc gaactgttcg 900
 ccaggctcaa ggcgcgcgtg cccgacggcg aggatctcg cgtgaccat ggcgatgcct 960
 gcttgcgaa tatacatggtg gaaaatggcc gctttctgg attcatcgac tggccggc 1020
 tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1080
 ttggcggcga atgggctgac cgcttcctcg tgcttacgg tatacgccct cccgattccgc 1140
 agcgcatcg cttctatcgc cttcttgacg agttttctcg agttcgcc cagatgttaa 1200
 cagaccacaa cggttccct ctggggat caattccgcc ccccccccta acgttactgg 1260
 ccgaagccgc ttgaaataag gcccgtgtc gtttgcctat atgttatttt ccaccatatt 1320
 gccgtctttt ggcaatgtga gggccggaa acctggccct gtcttctgta cgagcattcc 1380

taggggtctt	tccctctcg	ccaaaggaat	gcaaggctcg	ttgaatgtcg	tgaaggaagc	1440
agttcctctg	gaagcttctt	gaagacaaac	aacgtctgt	gcgaccctt	gcaggcagcg	1500
gaaccccca	cctggcgaca	ggtgcctctg	cggccaaaag	ccacgtgtat	aagatacacc	1560
tgcaaaggcg	gcacaacccc	agtgcacgt	tgtgagttgg	atagttgtgg	aaagagtcaa	1620
atggctctcc	tcaagcgat	tcaacaaggg	gctgaaggat	gcccagaagg	tacccattg	1680
tatggatct	gatctggggc	ctcggtgcac	atgcttaca	tgtgttagt	cgaggttaaa	1740
aaacgtctag	gccccccgaa	ccacggggac	gtggtttcc	tttggaaaac	acgataatac	1800
c atg gac	cgg gag atg	gca gca tcg	tgc gga ggc	gct ttc gta	ggt 1849	
Met Asp Arg	Glu Met Ala	Ala Ser Cys	Gly Gly Ala	Val Phe Val	Gly	
1	5	10	15			
ctg ata ctc ttg acc ttg tca	ccg cac tat aag	ctg ttc ctc	gct agg		1897	
Leu Ile Leu Leu Thr Leu Ser	Pro His Tyr Lys	Leu Phe Leu Ala	Arg			
20	25	30				
ctc ata tgg tgg tta caa tat	ttt atc acc agg	gcc gag gca	cac ttg		1945	
Leu Ile Trp Trp Leu Gln Tyr	Phe Ile Thr Arg	Ala Glu Ala	His Leu			
35	40	45				
caa gtg tgg atc ccc ccc	ctc aac gtt cgg	ggg ggc	cgc gat	gcc gtc	1993	
Gln Val Trp Ile Pro Pro	Leu Asn Val Arg	Gly Gly	Arg Asp	Ala Val		
50	55	60				
atc ctc ctc acg tgc	gct atc cac cca	gag cta atc	ttt acc atc	acc	2041	
Ile Leu Leu Thr Cys Ala	Ile His Pro Glu	Leu Ile Phe	Thr Ile Thr			
65	70	75	80			
aaa atc ttg ctc gcc	ata ctc ggt cca	ctc atg gtg	ctc cag gct	ggt	2089	
Lys Ile Leu Ala Ile Leu	Gly Pro Leu Met	Val Leu Gln	Ala Gly			
85	90	95				
ata acc aaa gtg ccg	tac ttc gtg cgc	gca cac ggg	ctc att cgt	gca	2137	
Ile Thr Lys Val Pro	Tyr Phe Val Arg	Ala His Gly	Leu Ile Arg	Ala		
100	105	110				
tgc atg ctg gtg cgg	aag gtt gct	ggg ggt	cat tat gtc	caa atg gct	2185	
Cys Met Leu Val Arg	Lys Val Ala	Gly Gly	His Tyr Val	Gln Met Ala		
115	120	125				
ctc atg aag ttg gcc	gca ctg aca ggt	acg tac gtt	tat gac	cat ctc	2233	
Leu Met Lys Leu Ala	Ala Leu Thr	Gly Thr	Tyr Val	Tyr Asp His		
130	135	140				
acc cca ctg cgg	gac tgg gcc	cac gcg	ggc cta	cga gac	2281	
Thr Pro Leu Arg Asp	Trp Ala His	Ala Gly	Leu Arg Asp	Leu Ala Val		
145	150	155	160			
gca gtt gag ccc	gtc ttc tct	gat atg	gag acc	aag gtt	2329	
Ala Val Glu Pro Val	Val Phe Ser Asp	Met	Glu Thr	Lys Val Ile		
165	170	175				
tgg ggg gca gac	acc gcg	tgt ggg	gac atc	atc ttg	2377	
Trp Gly Ala Asp	Thr Ala Ala	Cys Gly	Asp Ile	Ile Leu		
180	185	190				

gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser 195 200 205	2425
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210 215 220	2473
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240	2521
cg ^g gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cg ^g cg ^g Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380	2953
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val 385 390 395 400	3001
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val 405 410 415	3049

gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag.gtg ccg Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro 420 425 430	3097
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser 435 440 445	3145
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly 450 455 460	3193
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala 465 470 475 480	3241
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys 485 490 495	3289
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr 500 505 510	3337
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu 515 520 525	3385
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly 530 535 540	3433
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser 545 550 555 560	3481
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile 565 570 575	3529
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp 580 585 590	3577
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr 595 600 605	3625
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile 610 615 620	3673
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	3721

625	630	635	640														
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc	3769	
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser		
645								650						655			
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg	3817	
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala		
660				665							670						
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865	
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly		
675				680						685							
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cg	ccc	tcg	ggc	atg	ttc	gat	3913	
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp		
690				695						700							
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	g	gc	g	tc	t	gg	tac	gag	3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu		
705				710					715				720				
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	tt	cg	g	ct	t	ac	aa	3409	
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr		
725				730					735								
cca	ggg	ttt	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	ttg	gag	agc	gtc	4057	
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val		
740				745					750								
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105	
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys		
755				760					765								
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153	
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val		
770				775					780								
tgc	gcc	agg	gct	cag	g	ct	cca	cct	cca	tcg	ttg	gac	caa	atg	ttg	4201	
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys		
785				790					795			800					
tgt	ctc	ata	cg	cta	aag	cct	acg	ctg	cac	gg	cca	acg	ccc	ctg	ctg	4249	
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu		
805				810					815								
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297	
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	His	Pro	Ile			
820				825					830								
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345	
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr		
835				840					845								
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	g	tat	4393	

Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr		
850						855						860					
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc															4441		
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser		
865						870					875				880		
gga aag ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc															4489		
Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe		
						885				890				895			
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga															4537		
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly		
						900			905				910				
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa															4585		
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln		
						915			920				925				
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag															4633		
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys		
						930			935				940				
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc															4681		
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile		
						945			950				955		960		
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc															4729		
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro		
						965			970				975				
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc															4777		
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu		
						980			985				990				
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc															4825		
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala		
						995			1000				1005				
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc															4873		
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly		
						1010			1015				1020				
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg															4921		
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val		
						1025			1030				1035		1040		
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc															4969		
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala		
						1045			1050				1055				
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac															5017		
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn		
						1060			1065				1070				

cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg	5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
1075 1080 1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg	5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val	
1090 1095 1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc	5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
1105 1110 1115 1120	
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act	5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr	
1125 1130 1135	
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac	5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
1220 1225 1230	
ggg tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat	5545
Gly Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
1235 1240 1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc	5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	

acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg ccg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	
aaa ccc ctc cta ccg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca	5881
Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cg ^g cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca ccg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	

1505	1510	1515	1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525		1530		6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540	1545		1550	6457
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555	1560		1565	6505
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570	1575		1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585	1590	1595	1600	6601
gag gag gct agt gag gag gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp 1605	1610		1615	6649
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro 1620	1625		1630	6697
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr 1635	1640		1645	6745
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe 1650	1655	1660		6793
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu 1665	1670	1675	1680	6841
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu 1685	1690		1695	6889
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly 1700	1705		1710	6937
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His 1715	1720		1725	6985
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att				7033

Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag 7081			
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg 7129			
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
1765	1770	1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc 7177			
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu			
1780	1785	1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga 7225			
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly			
1795	1800	1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct 7273			
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro			
1810	1815	1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag 7321			
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu			
1825	1830	1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc 7369			
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala			
1845	1850	1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc 7417			
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile			
1860	1865	1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg 7465			
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg			
1875	1880	1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca 7513			
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr			
1890	1895	1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac 7561			
Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp			
1905	1910	1915	1920
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc 7609			
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser			
1925	1930	1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct 7657			
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala			
1940	1945	1950	

atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr 1955 1960 1965	7705
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 1975 1980	7753
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 1990 1995 2000	7801
ccc ctt gcg cggt gct ggg tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 2010 2015	7849
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 2040 2045	7945
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cggt gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160	8281
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165 2170 2175	8329

gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg 8377
 Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly
 2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427
 Val Gly Ile Tyr Leu Leu Pro Asn Arg *
 2195 2200

ggccaatagg ccatcctgtt tttttccctt ttttttttc tttttttttt tttttttttt 8487
 tttttttttt ttttctcctt tttttttcct cttttttcc ttttcttcc tttgggtggct 8547
 ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg actgcagaga 8607
 gtgctgatac tggcctctct gcagatcaag t 8638

<210> 25
 <211> 8638
 <212> DNA
 <213> HCV

<220>
 <221> CDS
 <222> (1802) ... (8407)

<400> 25

accagccccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg 60
 tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgcgtgcag cctccaggac 120
 ccccccctccc gggagagcca tagtggctcg cggAACCGGT gagtacaccg gaattgccag 180
 gacgaccggg tccttcttg gatcaacccg ctcaatgcct ggagatttg gggtggccccc 240
 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtaact gcctgataagg 300
 gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 360
 ctcaaagaaa aaccaaaggg cgccatgaa ttgaacaaga tggattgcac gcagggttctc 420
 cggccgcttg ggtggagagg ctattcggct atgactggc acaacagaca atcggctgct 480
 ctgatgcgcg cgtgttccgg ctgtcagcgc agggggcgccc gttttttt gtcaagaccg 540
 acctgtccgg tgcctgaaat gaactgcagg acgaggcagc gcggctatcg tggctggcca 600
 cgacggcgt tccttgcga gctgtctcg acgttgtcac tgaagcggga agggactggc 660
 tgctattggg cgaagtgcgcg gggcaggatc tcctgtcata tcaccttgct cctgccgaga 720
 aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgcatacg gctacctgcc 780
 cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc 840
 ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcggcagcc gaactgttcg 900
 ccaggctcaa ggccgcgcg cccgacggcg aggatctcg ctgtgaccat ggcgatgcct 960
 gcttgcgaa tatacatggtg gaaaatggcc gctttctgg attcatcgac tggccggc 1020
 tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc 1080
 ttggcggcga atgggctgac cgcttcctcg tgcttacgg tatacgccgt cccgattcgc 1140
 agcgcatcgc ctcttatcgc cttcttgacg agttcttctg agttcgcgc cagatgtaa 1200
 cagaccacaa cgggttccct ctgcggat caattccgcc cccccccta acgttactgg 1260
 cccgaagccgc ttgaataag gccgggtgtc gtttgcatacg atgttatttt ccaccatatt 1320
 gcccgtttt ggcaatgtga gggccggaa acctggccct gtcttctgca cgagcatcc 1380
 taggggtctt tccctctcg ccaaaggaaat gcaaggctcg ttgaatgtcg tgaaggaagc 1440
 agttcctctg gaagcttctt gaagacaaac aacgtctgtc gcgaccctt gcaggcagcg 1500
 gaaccccccga cctggcgaca ggtgcctctg cggccaaaag ccacgtgtat aagatacaccc 1560
 tgcaaaggcg gcacaacccc agtgcacatcg tgcgtgttgg atagttgtgg aaagagtc 1620
 atggctctcc tcaagcgat tcaacaagg gctgaaggat gcccagaagg taccatcg 1680
 tatgggatct gatctgggc ctcgggtgcac atgcattaca tgcgttttagt cgaggtaaa 1740
 aaacgtctag gccccccgaa ccacggggac gtgggtttcc tttgaaaaac acgataatac 1800
 c atg gac cgg gag atg gca gca tgc tgc gga ggc gcg gtt ttc gta ggt 1849

Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly		
1 5 10 15		
ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg	1897	
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg		
20 25 30		
ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg	1945	
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu		
35 40 45		
caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc	1993	
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val		
50 55 60		
atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc	2041	
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr		
65 70 75 80		
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt	2089	
Lys Ile Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly		
85 90 95		
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca	2137	
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala		
100 105 110		
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct	2185	
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala		
115 120 125		
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc	2233	
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu		
130 135 140		
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg	2281	
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val		
145 150 155 160		
gca gtt gag ccc gtc ttc tct gat atg gag acc aag gtt atc acc	2329	
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr		
165 170 175		
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	2377	
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro		
180 185 190		
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425	
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser		
195 200 205		
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	2473	
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser		
210 215 220		

caa cag acg cga ggc cta ctt ggc tgc atc atc acc agc ctc aca ggc	2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly	
225 230 235 240	
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala	
245 250 255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	
260 265 270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	
275 280 285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala	
290 295 300	
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	2761
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp	
305 310 315 320	
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cgg cgg	2809
Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg	
325 330 335	
ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg	2857
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu	
340 345 350	
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	2905
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val	
355 360 365	
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg	2953
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val	
370 375 380	
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc	3001
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val	
385 390 395 400	
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
405 410 415	
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	3097
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
420 425 430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser	
435 440 445	

gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450	455
460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465	470
475	480
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485	490
495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr	
500	505
510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515	520
525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
530	535
540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc	3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545	550
555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc	3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
565	570
575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat	3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580	585
590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat	3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
595	600
605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att	3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610	615
620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac	3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	
625	630
635	640
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc	3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser	
645	650
655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg	3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala	

660	665	670	
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly	675	680	685
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp	690	695	700
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu	705	710	715
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr	725	730	735
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val	740	745	750
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys	755	760	765
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val	770	775	780
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys	785	790	795
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu	805	810	815
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile	820	825	830
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr	835	840	845
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gct gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr	850	855	860
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser	865	870	875
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc			4489

Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe			
885	890	895	
gat gag atg gaa gag tgt gcc tca cac ctc cct tac atc gaa cag gga			4537
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly			
900	905	910	
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa			4585
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln			
915	920	925	
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag			4633
Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys			
930	935	940	
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc			4681
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile			
945	950	955	960
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc			4729
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro			
965	970	975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc			4777
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
980	985	990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc			4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
gcc caa ctt gct ccc agc gct gct tcc gct ttc gta ggc gcc ggc			4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg			4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc			4969
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala			
1045	1050	1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac			5017
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg			5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
1075	1080	1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg			5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	

cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala 1170 1175 1180	5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785

aaa ccc ctc cta cg ^g gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca	5881
Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cg ^g cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gc ^g atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
1505 1510 1515 1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
1525 1530 1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac	6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	

1540	1545	1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp			6505
1555	1560	1565	
gag ccc ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser			6553
1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser			6601
1585	1590	1595	
1600			
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			6649
1605	1610	1615	
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			6697
1620	1625	1630	
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			6745
1635	1640	1645	
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			6793
1650	1655	1660	
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			6841
1665	1670	1675	
1680			
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu			6889
1685	1690	1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			6937
1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			6985
1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			7033
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			7081
1745	1750	1755	
1760			
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129

Lys	Gly	Gly	Arg	Lys	Pro	Ala	Arg	Leu	Ile	Val	Phe	Pro	Asp	Leu	Gly	
1765								1770						1775		
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc															7177	
Val	Arg	Val	Cys	Glu	Lys	Met	Ala	Leu	Tyr	Asp	Val	Val	Ser	Thr	Leu	
1780							1785					1790				
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga															7225	
Pro	Gln	Ala	Val	Met	Gly	Ser	Ser	Tyr	Gly	Phe	Gln	Tyr	Ser	Pro	Gly	
1795						1800					1805					
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct															7273	
Gln	Arg	Val	Glu	Phe	Leu	Val	Asn	Ala	Trp	Lys	Ala	Lys	Lys	Cys	Pro	
1810						1815					1820					
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag															7321	
Met	Gly	Phe	Ala	Tyr	Asp	Thr	Arg	Cys	Phe	Asp	Ser	Thr	Val	Thr	Glu	
1825						1830					1835				1840	
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc															7369	
Asn	Asp	Ile	Arg	Val	Glu	Glu	Ser	Ile	Tyr	Gln	Cys	Cys	Asp	Leu	Ala	
1845						1850					1855					
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc															7417	
Pro	Glu	Ala	Arg	Gln	Ala	Ile	Arg	Ser	Leu	Thr	Glu	Arg	Leu	Tyr	Ile	
1860						1865					1870					
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg															7465	
Gly	Gly	Pro	Leu	Thr	Asn	Ser	Lys	Gly	Gln	Asn	Cys	Gly	Tyr	Arg	Arg	
1875						1880					1885					
tgc cgc qcg agc qgt gta ctg acg acc agc tgc qgt aat acc ctc aca															7513	
Cys	Arg	Ala	Ser	Gly	Val	Leu	Thr	Thr	Ser	Cys	Gly	Asn	Thr	Leu	Thr	
1890						1895					1900					
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac															7561	
Cys	Tyr	Leu	Lys	Ala	Ala	Ala	Cys	Arg	Ala	Ala	Lys	Leu	Gln	Asp		
1905						1910					1915				1920	
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc															7609	
Cys	Thr	Met	Leu	Val	Cys	Gly	Asp	Asp	Leu	Val	Val	Ile	Cys	Glu	Ser	
1925						1930					1935					
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct															7657	
Ala	Gly	Thr	Gln	Glu	Asp	Glu	Ala	Ser	Leu	Arg	Ala	Phe	Thr	Glu	Ala	
1940						1945					1950					
atg act aga tac tct gcc ccc cct ggg gac ccc ccc aaa cca gaa tac															7705	
Met	Thr	Arg	Tyr	Ser	Ala	Pro	Pro	Gly	Asp	Pro	Pro	Lys	Pro	Glu	Tyr	
1955						1960					1965					
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac															7753	
Asp	Leu	Glu	Leu	Ile	Thr	Ser	Cys	Ser	Ser	Asn	Val	Ser	Val	Ala	His	
1970						1975					1980					

gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cggt gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cggt gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	

ggccaatagg ccatcctgtt ttttccctt ttttttttc tttttttttt tttttttttt 8487
ttttttttt ttttctcctt ttttttcctt cttttttcc ttttcttcc tttgggtggct 8547
ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgctt gactgcagaga 8607
gtgctgatac tggcctctct gcagatcaag t 8638